

CLAIMS

1. An optical transmitting and receiving module comprising:

5 a light transmitting substrate, transmitting light of a first wavelength;

a laser diode, set on the light transmitting substrate and emitting light of a second wavelength that differs from the first wavelength;

a photodiode, mounted on a rear surface side of the light transmitting substrate surface on which the laser diode is disposed;

10 a dielectric film filter, reflecting light of the first wavelength and transmitting light of the second wavelength; and

an optical input and output portion, inputting light emitted from the laser diode and outputting light to the photodiode;

15 the dielectric film filter being set in an inclined groove, formed at a predetermined inclination angle in the light transmitting substrate, so as to match optical paths between the photodiode and the optical input and output portion and match optical paths between the laser diode and the optical input and output portion.

2. The optical transmitting and receiving module according to Claim 1, wherein the light transmitting substrate is a silicon substrate.

3. The optical transmitting and receiving module according to Claim 1, wherein the inclined groove is formed by anisotropic etching.

25 4. The optical transmitting and receiving module according to Claim 1, wherein the photodiode is positioned directly below a line connecting the laser diode and the optical input and output portion.

5. The optical transmitting and receiving module according to Claim 4, wherein a plurality of sets of the photodiode, the laser diode, and the dielectric film filter are disposed in array form.

6. The optical transmitting and receiving module according
5 to Claim 1, wherein lenses are disposed respectively between the dielectric film filter and the laser diode and between the dielectric film filter and the optical input and output portion.

7. The optical transmitting and receiving module according
10 to Claim 1, wherein a converging lens that converges light onto the photodiode is disposed on a top surface of the light transmitting substrate.

8. The optical transmitting and receiving module according to Claim 7, wherein the converging lens is formed by ion beam etching.

9. The optical transmitting and receiving module according
15 to Claim 1, wherein the optical input and output portion is a front end portion of an optical fiber.

10. The optical transmitting and receiving module according to Claim 1, wherein the optical input and output portion is a front end portion of an optical waveguide.